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<b>PRE-APPEAL BRIEF REQUEST FOR REVIEW</b>		Docket Number (Optional)  ATTANA-2						
<p>I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to "Mail Stop AF, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450" [37 CFR 1.8(a)]</p> <p>on _____</p> <p>Signature _____</p> <p>Typed or printed name _____</p>	<table border="1" style="width: 100%; border-collapse: collapse;"><tr><td style="width: 60%; padding: 5px;">Application Number  10/542616</td><td style="width: 40%; padding: 5px;">Filed  18 July 2005</td></tr><tr><td colspan="2" style="padding: 5px;">First Named Inventor  Teodor Aastrup</td></tr><tr><td style="padding: 5px;">Art Unit  2856</td><td style="padding: 5px;">Examiner  Fitzgerald</td></tr></table>		Application Number  10/542616	Filed  18 July 2005	First Named Inventor  Teodor Aastrup		Art Unit  2856	Examiner  Fitzgerald
Application Number  10/542616	Filed  18 July 2005							
First Named Inventor  Teodor Aastrup								
Art Unit  2856	Examiner  Fitzgerald							
<p>Applicant requests review of the final rejection in the above-identified application. No amendments are being filed with this request.</p>  <p>This request is being filed with a notice of appeal.</p>  <p>The review is requested for the reason(s) stated on the attached sheet(s). Note: No more than five (5) pages may be provided.</p>  <p>I am the</p> <table style="width: 100%;"><tr><td style="width: 50%; vertical-align: top;"><p><input type="checkbox"/> applicant/inventor.</p><p><input type="checkbox"/> assignee of record of the entire interest. See 37 CFR 3.71. Statement under 37 CFR 3.73(b) is enclosed. (Form PTO/SB/96)</p><p><input type="checkbox"/> attorney or agent of record. Registration number _____</p><p><input checked="" type="checkbox"/> attorney or agent acting under 37 CFR 1.34. Registration number if acting under 37 CFR 1.34 <u>32585</u></p></td><td style="width: 50%; vertical-align: top;"><p><u>/Jeffrey B. Oster/</u> Signature</p><p><u>Jeffrey B. Oster</u> Typed or printed name</p><p><u>2067135467</u> Telephone number</p><p><u>03 February 2009</u> Date</p></td></tr></table> <p>NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below".</p>			<p><input type="checkbox"/> applicant/inventor.</p> <p><input type="checkbox"/> assignee of record of the entire interest. See 37 CFR 3.71. Statement under 37 CFR 3.73(b) is enclosed. (Form PTO/SB/96)</p> <p><input type="checkbox"/> attorney or agent of record. Registration number _____</p> <p><input checked="" type="checkbox"/> attorney or agent acting under 37 CFR 1.34. Registration number if acting under 37 CFR 1.34 <u>32585</u></p>	<p><u>/Jeffrey B. Oster/</u> Signature</p> <p><u>Jeffrey B. Oster</u> Typed or printed name</p> <p><u>2067135467</u> Telephone number</p> <p><u>03 February 2009</u> Date</p>				
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<p><input checked="" type="checkbox"/> Total of <u>1</u> forms are submitted.</p>								

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application No.: 10/542,616 Confirmation No.: 7334  
Applicants: Teodor Aastrup et al.  
Filing Date: 18 July 2005  
Art Unit: 2856  
Examiner: John Fitzgerald  
Attorney Docket No.: ATTANA-2  
Customer No.: 29039  
Title: Piezoelectric Resonator  
Date: 04 February 2009

Mail Stop AF  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Pre-Appeal Brief Request for Review

Sir:

This Pre-Appeal Brief, filed a few days after a Notice of Appeal, will attempt to have a supervisory review of the above-identified patent application file history because applicants (1) have provided evidence of record that has not been considered in view of the strange remarks made by the Examiner in the Final Office Action and his inability to follow MPEP protocol in examining this patent application; (2) have provided evidence of surprising results that has not been considered in view of the strange remarks made by the Examiner in the Final Office Action; (3) have shown that the Examiner has never made a *prima facie* case of obviousness because the Examiner had to make up a "scientific theory" to supplement the cited references, a speculative theory that contradicts what actual scientists of ordinary skill in the art have already done (see Aastrup Declaration) and is not prior art to the present invention; and (4) have mischaracterized the claimed invention by equating the two cited references as encouraging "modification" of electrode size when the claimed invention is a specific alteration in making the electrode size smaller and not "modified in the way Thompson et al. modifies the electrode geometry by drilling a hole in it.

## Status of the Claims

Claims 1-5, 8-10 and 23-28 are pending. The broadest claim is claim 1. Claim 1 is a “thickness shear mode piezoelectric resonator for use in a sensor arrangement for detecting or measuring an analyte in a medium by mass changes” (preamble) and claims 2-13 and 25-28 depend (directly or indirectly) from claim 1. Claims 23-24 are a method of sensing using the resonator of claim 1.<sup>1</sup> Claim 1 can be broken down to the following limitations:

Claim Limitation	Comment
<b>Claim 1.</b> A thickness shear mode piezoelectric resonator for use in a sensor arrangement for detecting or measuring an analyte in a medium by mass changes	Claim preamble <sup>2</sup> . No limitation provided.
(a) a quartz crystal plate having a first crystal surface having an edge and a second crystal surface	Applicants consider that this limitation is provided in the two cited references.
(b) said first crystal surface comprises a first electrode having a continuous surface area of less than 15 mm <sup>2</sup> and an electrode edge	The Examiner admits that neither cited reference discloses this limitation. More specifically, the prior art first crystal surfaces are larger in surface area. In addition, Thompson et al. suggest improving sensitivity by increasing edge dimensions, by drilling a hole in the first crystal surface, not by making it smaller. Further still, the Aastrup Declaration provides three contemporaneous references that sought to improve sensitivity by making the first crystal surface area larger, not smaller.
(c) said second crystal surface comprises a second electrode.	Applicants consider that this limitation is provided in the two cited references.

Therefore, the file history has focused on limitation (b) wherein the Examiner, on multiple occasions in the file history, admits that the two cited references (Thompson et al. and Josse et al.) do not teach or disclose this limitation. In the 15 April 2008 Office Action, the Examiner admits that Thompson et al. does not disclose limitation (b)<sup>3</sup>. In the 15 April 2008 Office Action, the Examiner admits that Josse et al. does not disclose limitation (b)<sup>4</sup>. These admissions caused the Examiner to create, all by himself, a speculative “scientific theory” to fill in the missing

<sup>1</sup> Therefore, the patentability of method claims 23-24 depend on the patentability of claim 1.

<sup>2</sup> A preamble is only limiting where “it recites essential structure or steps, or where it is necessary to give ‘life, meaning and vitality’ to the claims.” *Intertool, Ltd. v. Texar Corp.*, 369 F.3d 1289, 1295 (Fed. Cir. 2004).

<sup>3</sup> The Examiner stated: (“Thompson et al. does not specifically disclose quantitative measurements of the electrodes, i.e. the first crystal surface having a first electrode having a surface area of less than 15 mm<sup>2</sup>, 10 mm<sup>2</sup> or 1-5 mm<sup>2</sup> (as recited in claims 1, 2, 25).”

<sup>4</sup> The Examiner stated: (“Josse et al. does not disclose specific quantitative surface areas of the electrode(s), that is, specific dimensional/geometric aspects of the electrodes(s) (i.e. surface area <15 mm<sup>2</sup> or 10 mm<sup>2</sup> or is 1-5 mm<sup>2</sup> or the distances between the crystal edge and the electrode edge being at least 0.2 mm or 1 mm or 2 mm) (as recited in claims 1-3, 5 and 25-28).”

disclosure. Accordingly, the Examiner admits that neither Thompson et al. nor Josse et al. discloses or suggests element (b) of claim 1.

The Examiner instead tried to dance around his inability to make a *prima facie* obviousness rejection by trying to say that Thompson et al. suggests an unspecified “modification” of the electrode. But the Examiner ignored the evidence submitted herein<sup>5</sup> and ignored that the “modification” suggested by Thompson et al was not to make the electrode smaller.<sup>6</sup> Instead, the Examiner created his own speculative and unsubstantiated “scientific theory” that he treated as prior art but that “scientific theory” had no publication date (except as it became more and more embellished in each successive office action). Therefore, this patent application is going to appeal because applicants have found themselves unable to have their evidence supporting the patentability of the claim considered and have been “chasing ghosts” to indicate that the “scientific theory” is not prior art, does not reflect what a person of ordinary skill in the art would have learned from either Thompson et al. or Josse et al.<sup>7</sup>, and the theory speculates what a person of ordinary skill in the art *would possibly do* when the evidence of record in the Aastrup Declaration provides what people of ordinary skill in the art actually *did do*. Thus, the Examiner’s “scientific theory” is wrong as far as speculating what a person of ordinary skill in the art would have done. Therefore, in the limited space allowed, applicants shall reference the prior arguments they have made establishing that applicants have met their burden of proof establishing the patentability of pending claims 1-5, 8-10 and 23-28.

### **35 U.S.C. §103 Rejection in View of Thompson et al.**

Claims 1-5 and 8-10 and 25-28 were rejected as unpatentable under 35 U.S.C. §103 over Thompson et al. (U.S. Patent Application 2003/0076743) in view of the Examiner’s “scientific theory.” Applicants advanced four arguments, each supported by evidence. Each argument is provided in more detail in Amendments D and E in the file history.

1. The Examiner’s “scientific theory,” whatever it is, is not prior art. In each successive Office Action, the Examiner relied on his theory to support the deficiency in Thompson et al. Simply put, the Examiner never pointed to any prior art reference that explained his theory why

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<sup>5</sup> In the form of the Aastrup rejection, which concludes: “My conclusion from the disclosures of Lu et al. I, Lu et al. II and Wu et al. is that all three references suggest to increase the area or size of the electrodes in QCM for improving sensitivity and not make the electrodes smaller as we have done in our invention.” It should be noted that Dr. Aastrup is a co-inventor of this patent application and that the three references supplied (Lu et al. I, Lu et al. II and Wu et al.) are contemporaneous with the present invention and are of record herein.

<sup>6</sup> It should be noted that the claimed invention provides surprising results in the specification (see in particular pages 17-19 where it states: “The sensitivity in measuring the difference between PBS solution and di-ionized water of the small (4 mm<sup>2</sup>) electrode was thus much higher than the sensitivity of the standard (15,9 mm<sup>2</sup>) electrode, a sensitivity increase exceeding a factor of ten.” Note that the European convention is used instead of 15.9)

<sup>7</sup> It should be noted that the evidence showing what “modification” a person of ordinary skill in the art would have made at the time of the present invention was already submitted as evidence that was not considered by the Examiner in the form of the Aastrup Declaration.

one would be motivated to make electrode surface area smaller.<sup>8</sup> Therefore, this rejection requires the “scientific theory” and that theory is not prior art because it was first expressed (as a reason to make electrodes smaller in continuous surface area) in the Office Actions.

2. Thompson et al. teaches away from the claimed invention. Thompson et al. suggests that one can improve sensitivity by drilling a hole to increase edge distances.<sup>9</sup> Further, Thompson et al. teaches that making an electrode smaller causes undesired “instability” something that a person of ordinary skill in the art would not want to do. Thus, Thompson et al. teaches away from the claimed invention that is based on making the continuous surface area smaller, not by drilling a hole.

3. The specification (see pages 17-19 and associated Figures) provide surprising results to fulfill the applicants burden of proof of patentability. That is evidence of secondary consideration of patentability. Another piece of evidence of secondary consideration of patentability is the Aastrup Declaration that provides three contemporaneous references that each disclose to increase the area of the electrode to improve sensitivity. These three references show that (a) a person of ordinary skill in the art would not be motivated to decrease surface area, but to increase surface area. (b) the Aastrup Declaration also refutes the Examiner’s “scientific theory” as *incorrect speculation of what a person of ordinary skill in the art would do* by providing evidence of what several groups of authors of three references *actually did do*. The file history shows that this evidence was never considered by the Examiner.<sup>10</sup>

4. The Examiner has never established a *prima facie* case of obviousness. As noted above, the Examiner admitted that element (b) is not disclosed or suggested in Thompson et al. To fill in the gap, the Examiner created the “scientific theory.” But the “scientific theory” is not prior art. Therefore, no *prima facie* case of obviousness can be established.

### **35 U.S.C. §103 Rejection in View of Josse et al.**

Claims 1-5 and 8-10 and 25-28 were rejected as unpatentable under 35 U.S.C. §103 over Josse et al. (U.S. Patent Application 2003/0076743) in view of the Examiner’s “scientific theory.” Applicants advanced arguments 1 and 3-4 above as noted for Thompson et al. each supported by the same evidence. In addition, the Examiner has again admitted that Josse et al. does not disclose

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<sup>8</sup> It should be noted that there are specific size dimensions provided in element (b) of claim 1 and that such dimensions are smaller than existing commercial electrodes. Moreover, Thompson et al. discloses drilling a hole in the electrode to increase edge linear dimensions, not making the electrode smaller in continuous surface area.

<sup>9</sup> Thompson et al. is misrepresented because the Examiner has quoted Thompson et al. in bold on page 4 of the Final Office Action showing that Thompson et al. states that “since reducing the electrode size of one of the electrodes causes instability in device resonance.” Thompson et al. does not “disclose teachings in regards to the variation and modification of geometry of the electrode(s), in particular, their total surface area, as well as perimeter edge distances” as the Examiner alleges. Thompson et al. teaches drilling a hole in the electrode to add to edge areas, plain and simple. Accordingly, Thompson et al. has been misrepresented by the Examiner.

<sup>10</sup> It appears that the Examiner was looking to engage applicants in an academic seminar-type discussion regarding theories and other speculations, something the applicants refused to do as inappropriate for a patent prosecution.

or suggest the limitation of claim 1. (“a continuous surface area of less than 15 mm<sup>2</sup>”), but instead some how dances around this issue by stating: “Although Josse et al. does not disclose specific quantitative surface areas of the electrode(s), that is, specific dimensional/geometric aspects of the electrodes(s) (i.e. surface area <15 mm<sup>2</sup> or 10 mm<sup>2</sup> or is 1-5 mm<sup>2</sup> or the distances between the crystal edge and the electrode edge being at least 0.2 mm or 1 mm or 2 mm) (as recited in claims 1-3, 5 and 25-28), Josse et al. does carefully teach and explain that ‘conductivity of the loading medium results in the expansion of the effective electrode surface area, and that the electrode regions and their electrostatic capacitance is a result of the electrode size, shape and configuration, in other words, the electrode surface area.’” In view of that sentence and the need for so many words to both admit that the two key claim limitations for the first electrode are nowhere found in Josse et al. and then try to dance around that fact with loads of unsupported tangential statements, applicants traversed this rejection with the same arguments listed as 1 and 3-4 for Thompson et al. above.

Specifically, in Amendment D, applicants argued: (a) evidence in the Aastrup Declaration shows the failure of others and a teaching away from the claimed invention, (b) there was a lack of a showing or *prima facie* obviousness, and (c) because the Examiner admits that Josse et al. fails to disclose or suggest the key limitation of electrode area and size. In addition, in Amendment E, applicants also argued: (d) the scientific theory expounded upon by the Examiner is mere speculation and not evidence, and (e) the scientific theory is not prior art.

#### Summary

Applicants have met their burden of proof showing the patentability of pending claims 1-5, 8-10 and 23-28. Accordingly, applicants respectfully request that a three Examiner panel of SPE’s thoroughly review this file history to more efficiently reach a resolution regarding the legal issue of patentability of pending claims 1-5, 8-10 and 23-28 based on the facts and evidence of record herein, rather than the “scientific merits” of rank speculation in the form of the Examiner’s “scientific theory.”

Respectfully submitted,  
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